C++ ASSIGNMENT

1.Ques :Write a program to print the elements of both the diagonals in a square matrix.

Ans:

```
#include<iostream>
using namespace std;
int main(){
	int m;
	cout<<"Enter rows: ";
	cin>>m;
	cout<<"Enter cloumns: ";
	int n;
	cin>>n;
	int arr[m][n];
	for(int i=0;i<=m-1;i++){
		for(int j=0;j<=n-1;j++){
			cin>>arr[i][j];
		}
	}
	for(int i=0;i<=m-1;i++){
	 for(int j=0;j<=n-1;j++){
			if(i==j||(j==n-1&&i==0)||(i==m-1&&j==0)){
				cout<<arr[i][j]<<" ";
			}
			else cout<<" ";
		}
		cout<<endl;
	}
	return 0;
```

}

2.Ques :Write a program to rotate the matrix by 90 degrees anti-clockwise.

Ans:

```
#include<iostream>
using namespace std;
int main(){
	int m;
	cout<<"Enter rows/coloumn: ";
	cin>>m;
	int arr[m][m];
	for(int i=0;i<=m-1;i++){
		for(int j=0;j<=m-1;j++){
			cin>>arr[i][j];
		}
	}
	for(int i=0;i<=m-1;i++){
		for(int j=0;j<=m-1;j++){
			cout<<arr[i][j]<<" ";
		}
		cout<<endl;
	}
	for(int k=0;k<=m-1;k++){
		int i=0;
		int j=m-1;
		while(i<=j){
			int temp=arr[i][k];
			arr[i][k]=arr[j][k];
			arr[j][k]=temp;
			i++;
			j--;
```

```
            }
        }
        for(int i=0;i<=m-1;i++){
            for(int j=0;j<=m-1;j++){
                cout<<arr[i][j]<<" ";
            }
            cout<<endl;
        }
        return 0;
}
```

3.Ques :Write a program to print the matrix in wave form.

Input :
1 2 3
4 5 6
7 8 9
Output : 7 4 1 2 5 8 9 6 3

Ans:

```
#include<iostream>
using namespace std;
int main(){
        int m;
        cout<<"Enter rows: ";
        cin>>m;
        cout<<"Enter cloumns: ";
        int n;
        cin>>n;
        int arr[m][n];
        for(int i=0;i<=m-1;i++){
            for(int j=0;j<=n-1;j++){
                cin>>arr[i][j];
            }
```

```
    }
    for(int j=0;j<=n-1;j++){
        if(j%2==0){
            for(int i=m-1;i>=0;i--){
            cout<<arr[i][j]<<" ";
        }
        }
        else{
            for(int i=0;i<=m-1;i++){
            cout<<arr[i][j]<<" ";
        }
        }
    }
    return 0;
}
```

4.Ques: Given a positive integer n, generate a n x n matrix filled with elements from 1 to n2 in spiral order.

Input 1: n = 3

Output 1: [[1,2,3],[8,9,4],[7,6,5]]

Input 2: n = 1

Output 2: [[1]]

Ans:

```
#include<iostream>
using namespace std;
int main(){
    int n;
    cout<<"Enter rows: ";
    cin>>n;
    int maxr=n-1;
    int maxc=n-1;
    int minr=0;
```

```
int minc=0;
int a=1;
int arr[n][n];
while(minr<=maxr&&minc<=maxc){
        for(int j=minc;j<=maxc;j++){
        arr[minr][j]=a;
        a++;
}
minr++;
if (minr>maxr||minc>maxc) break;
        for(int i=minr;i<=maxr;i++){
        arr[i][maxc]=a;
        a++;
}
maxc--;
if (minr>maxr||minc>maxc) break;
        for(int j=maxc;j>=minc;j--){
        arr[maxr][j]=a;
        a++;
}
maxr--;
if (minr>maxr||minc>maxc) break;
        for(int i=maxr;i>=minr;i--){
        arr[i][minc]=a;
        a++;
}
minc++;
if (minr>maxr||minc>maxc) break;
}
for(int i=0;i<=n-1;i++){
```

```
            for(int j=0;j<=n-1;j++){
                cout<<arr[i][j]<<" ";
            }
            cout<<endl;
        }
        return 0;
}
```

5.Ques:Predict the output :

```
int main(){
int a[][2] = {{1,2},{3,4}};
int i, j;
for (i = 0; i < 2; i++)
for (j = 0; j < 2; j++)
cout << a[i][j];
return 0;
}
```

Ans: 1 2 3 4